ASOS MODIFICATION NOTE 45 (for Electronics Technicians)
Engineering Division
W/OSO321:BGM

SUBJECT	:	Connection of the Automated Surface Observing System (ASOS) to the Federal Aviation Administration (FAA) communication network using codex modems
PURPOSE	:	To enable communication between ASOS and the National Weather Service telecommunications gateway via the FAA communication network
EQUIPMENT AFFECTED	:	ASOS, ACU (ACOMM)
PARTS REQUIRED	:	Bridging clips, 66-series (4ea) RJ-11 surface mounted block RJ-11 connectors (as required) RJ-45 connectors (as required) RJ-11 4 conductor stranded telco cable (as required) 24 AWG 4-wire telco cable wire to connect a surface mounted block to demarc panel.
MOD PROCUREMENT	:	Technicians will obtain materials locally. The National Weather Service Headquarters (WSH) will issue SIO boards for sites listed in Appendices A and B.
SPECIAL TOOLS REQUIRED	:	RJ-11/RJ-45 connector crimping tool (1ea) Punch down tool (1ea)
TIME REQUIRED	:	2.5 hours
EFFECT ON OTHER INSTRUCTIONS	:	None
AUTHORIZATION	:	Not Applicable

GENERAL

Technicians must coordinate with the FAA point of contact before scheduling the installation of this modification at any site. The FAA point of contact is Jerry Kranz at 202-267-8675 or E-mail address Jerry.Kranz@FAA.dot.gov. Any technical questions should be directed to Woody Weir (ASOS Maintenance Assurance Department) at 301-713-1835, Ext. 129. Motorola Codex 3600 modems are being used with many ASOS, to enable communication between the ASOS and the (NWS) telecommunications gateway, via the FAA communication network. The codex modem can be installed, either internal or external of the ASOS Acquisition Control Unit (ACU) cabinet near the FAA communication network equipment. Each configuration, internal or external to the ACU requires different connection procedures. This modification handles each configuration separately.

CAUTION

ADAS (AWOS / ASOS Data Acquisition System) synchronization requires the ASOS SIO port for the Codex to be set to external synchronization when the port is configured. Since SIO port synchronization is controlled in pairs, both ports 1 and 2 or ports 3 and 4 shall be set to external synchronization. If port 1 is used for the Codex modem, port 2 should be left unused (vise-versa if port 2 is used for the modem) and ports 3 and 4 may be used for any other ASOS connection. Likewise, if port 3 is used for the Codex modem, port 4 should remain unused (vise-versa if port 4 is used for the modem) and ports 1 and 2 will be available for other ASOS use. The connection of ASOS peripherals to the other half of an SIO port pair configured for a Codex will result in intermittent communications with the ASOS peripheral. All ASOS connections are via RS-232 and any ASOS configuration utilizing RS-422 on SIO Board #1 must be changed to an unused RS-232 board.

<u>BEFORE CONNECTING THE MOTOROLA CODEX MODEM</u>

1.   The installer shall coordinate with the FAA point of contact, Jerry Kranz at 202 -267-8675, prior to scheduling work on this modification.

2.   Once on site, call the AOMC at 1-800-242-8194 and tell them which ASOS Motorola Codex modem will be connected.

3.   Get approval of the responsible MIC/OIC before starting installation. Connect the Motorola codex modem on any day of the month. Steps 3 thorough 8 apply only to those sites listed in Appendix A requiring the installation of an SIO card identified with a check mark (T). Continue to step 9 if an SIO card is not required.

4.   Commissioned sites only: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within three hours. The responsible MIC/OIC will define these meteorological conditions.

5.   Do not start the installation at a time that will conflict with scheduled synoptic observations at, 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 15 minutes should be sufficient, allow 1 hour to complete installation and restart ASOS.

6.   Immediately before working at NWS staffed sites, the MIC/OIC/Observer will inform the tower and any other critical users that ASOS will be shut off for Motorola Codex modem connection. At an unstaffed site, the technician will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID).

7.   Do not begin the installation process until immediately after they have transmitted an hourly observation. At NWS-staffed sites, they will carry out normal backup observing procedures.

8. Disable all hardwire and dial communication ports to ASOS, (REVUE-SITE-CONFG-COMMS). Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from AUTO UPLOAD REQ to COMPLETE before going to the next step. The system voice function will automatically broadcast a not available message when the ACU power is turned off.

9. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 45

   a. Key the MAINT screen;
   b. Key the ACT page;
   c. Key START - Stop here and preform Mod 45; and
   d. Upon completion of the Mod 45, log onto the system.

AFTER COMPLETING MODIFICATION

10. Step 10 through 12 are only required if an SIO card has been installed. When ASOS is restarted at nonstaffed sites, call to inform towers that the work is complete. (At staffed sites, the MIC/OIC observer will call the tower).

11. If on-site NWS staff provides backup while the installation is underway, special observation is not needed when the wind system is restarted.

12. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. Augmenting several elements may be necessary or even the entire observation. The chart below shows the times needed for ASOS to report each observation element automatically after a start up.

Times Needed for Elements to be Reported Automatically

	Minimum	Maximum
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

13. Verify that the ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:

a. Your location;
b. That connection of the codex modem has been completed; and
c. That the ASOS is operational;

14. Enter the SYSLOG information to indicate that maintenance has been completed.

a. Key the MAINT screen;
b. Key the ACT page;
c. Key FMK - Enter the Field Mod Kit (FMK) number as follows: Mod 45;
    On the second line of the screen verify that only Mod 45 is displayed. Complete by entering Y in the Y/N line if only Mod 45 is displayed.
d. Check the SYSLOG and verify the FMK message. Enter a comment in the SYSLOG stating that THE CODEX MODEM has been connected.

15. Complete this step if an SIO card was installed. At an expansion site with ATCT, the technician will contact the ATCT and supply information on the following:

a. ASOS maintenance is completed;
b. ASOS have been restored to service;
c. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on; and
d. This completes modification note 45.

Reporting Modification

A completion target date of this modification is 5 days after long line connection. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code ACOMM. See Appendix C for a completed sample of WS Form A-26.

** In Block 8, of the A-26, enter the serial number of the ACU
** In Block 18, of the A-26, enter ASN and S/N of SIO board and modem (if installed).

John McNulty
Chief, Engineering Division

Appendix   A
Appendix   B
Appendix   C

INSTALLATION OVERVIEW FOR CONNECTING AN INTERNAL CODEX MODEM:

This procedure identifies pre-installation activity steps necessary to verify proper installation of cabling from the modem to the demarc, procedures for installing the surface mounted RJ-11 block (if not already provided by the FAA), and the modem settings required for operation.

The codex modem installed inside the ACU cabinet will use a leased line between the ASOS codex modem and a similar codex modem located at an FAA Air Route Traffic Control Center (ARTCC). The 4 wire leased line will be provided by the FAA. Information on the circuit number should be provided by the FAA point of contact.

Activation of the codex modem interface requires coordination between the ASOS technician, at the ASOS site and the FAA technician at the ARTCC. The FAA technician activates the FAA center communication equipment. The ASOS technician checks several basic modem parameters and completes the connection between I/O panel assembly 1A9, J-8 on the back panel of the ACU and the FAA telco demarc located on a wall nearby.

The FAA demarc typically consists of a 66-series analog communication block (punch down block). The NWS technician will perform the proper routing of the cable from the ACU to the 66-series block if required. This includes installation of a surface mount RJ-11 jack near the 66-series block (if not already installed) and attaching the 4-wire, telco cable between I/O panel assembly 1A9, J-8 on the ACU and the surface mount RJ-11 jack.

PROCEDURE:

1.0 INTERNAL CODEX MODEM CONNECTION/ACTIVATION AT THE ASOS SITE:

Before traveling to an ASOS Site:

a. Sites listed in **Appendix A** contain **internal codex modems**. Verify that a codex modem has been installed in the ASOS ACU. If a modem has not been installed, inform the FAA point of contact.

b. Contact Jerry Kranz who will assist with testing the ASOS to FAA network communication link. Establish a date and time when the FAA point of contact will be available to provide detailed telephone support during installation. The FAA point of contact will provide the modem address to be programmed into the codex modem (if necessary).

c. Sites listed in Appendix A that require installation of an SIO card are indicated by a check mark (T). Remotely access the ASOS and verify that an SIO port is available to be assigned to the codex modem (ADAS). Two consecutive ports on a single SIO card must be available. Ports 1 and 2, or Ports 3 and 4, are the only allowable configurations. If the ports are not available, an additional SIO board (XVME-490/1) is required. Contact Bobby McCormick to obtain an SIO board.

2.0 INSTALLATION STEPS FOR INTERNAL CONNECTION AND ACTIVATION:

Once at a site, complete the following:

a. Verify that the codex modem has been installed in the ACU cabinet and that power is connected.

b. Verify that the connector from the correct SIO board and port is connected to the back of the codex modem. For a codex modem with a Standard flex cartridge (P/N M10454) the DB-25 connector should be on modem Port 1. For a codex modem with a Premium flex cartridge (P/N M10493) the DB-25 connector should be on modem Port 6.

c. Verify that a telco cable has been connected between the LEASE RJ-45 jack
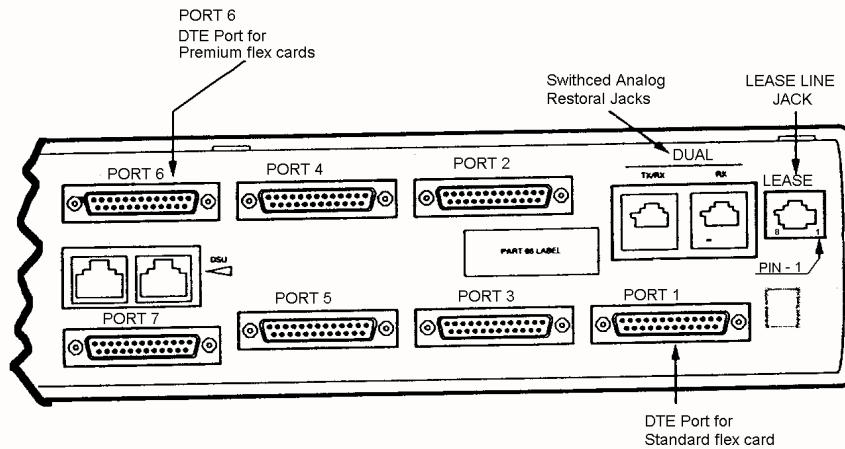
(reference diagram below) on the rear of the codex modem and ACU I/O panel assembly 1A9J-8 (an RJ-11 jack) via the EMI filter. Verify that this cable is wired as follows:

RJ-45 PIN	COLOR/FUNCTION	RJ-11 PIN
1	Red or Green / Transmit	2
2	Green or Red / Transmit	3
7	Yellow or Black / Receive	1
8	Black or Yellow / Receive	4

If a cable is found incorrectly wired at the site, it can be corrected by cutting off one of the connectors and rewiring the cable.

d. Find the incoming 4-wire telco line termination point. This is usually a 66-series cross-connect block or an RJ-11 surface mount block on the wall near the ACU. The FAA point of contact should provide assistance in locating and verifying the correct circuit.

e. If a RJ-11 surface mount block (jack) has been installed, connect the RJ-11 block to J-8 on the ACU I/O panel using a cable made to length at the ASOS site.

f. Use steps 1 through 6 to install the RJ-11 block, (if one has not already installed), and connect it to the cross connect block and the ACU I/O panel.

  1. Mount a RJ-11 surface mounted block on the wall near the existing telco installation.

  2. Find the leased 4-wire circuit on the cross connect block. The circuit should connect to four punch down terminals at the top of the block. The 4-wire leased circuit may be connected to some FAA circuit loopback equipment (responder) and back to the block. The FAA point of contact should have already verified (if possible), that the lines between the FAA ARTCC and the ASOS site are active and operating at the proper levels.

  3. Determine the transmit and receive pairs by either finding a tag on the circuit or asking the FAA technician at the Center to send a tone on one of the pairs. By convention, the top two terminals should be the ASOS codex modems transmit pair and the bottom two the ASOS modem receive pair.

  4. Connect the RJ-11 block to the cross connect block to continue the 4-wire circuit to the ASOS modem. Use 24-26 AWG solid data comm wire intended for insulation displacement termination. RJ-11 connector pins 2 and 3 (red and green) connect to the transmit pair and pins 1 and 4 (yellow and black) connect to the receive pair.

  5. Connect the RJ-11 block to J-8 on the ACU I/O panel using a 4-conductor cable made to length at the ASOS site.

  6. Using bridging clips as jumpers, connect the four wires installed in step d. Above to the FAA connection side of the 66 block by bridging the middle contacts together.

g. The ASOS SIO port that communicates with the codex modem must be configured properly and enabled. Ensure that the SIO port configuration, obtained from the ASOS COMMS configuration page, reflects the following:

FUNCTION	ADAS	**HANDSHAKE**	SYNCHRONOUS
STATUS	ENABLED	**CONNECTION**	HARD-WIRE
BAUD RATE	2400		
PARITY SELECT	NONE		
BITS/CHAR	8		
STOP BITS	1		

h. The ASOS ADDRESS field on the ASOS EXTERNAL COMMUNICATIONS page (REVUE-SITE-CONFG-EXTRN) will need to contain the ASOS polling address as assigned by the FAA data acquisition system (ADAS). This parameter can be entered by the ASOS technician if it is available, or it can be entered by the AOMC when it becomes available. By default the address is 100, which is an invalid ADAS address. Valid addresses are odd numbers from 03 to 21.

I. The codex modem will need several parameters to be set before the FAA center will be able to remotely program the remaining strapping parameters. The information necessary to access the modem menus is presented in the codex modem chapter of the ASOS site technical manual (chapter 13). The parameters that need to be set are:

1. The **ADDRESS** field under the **NTK CTL** * category to the designated modem address (obtain from FAA POC).

2. The TX LVL: field under the ANALOG*> LS ANLG+ category to -13 dBm.

3. If this is a multi point circuit (modem uses a "Standard" Flex cartridge), the OP MODE: field under the ANALOG*> LS ANLG+ category must be set to MP-S. If this is a point to point circuit (modem uses a "Premium" Flex cartridge), the OP mode field under the ANALOG *> LS ANGL + category must be out to TURBO P-P.

j. The technician at the ARTCC should now be able to remotely download the complete modem strapping parameters.

k. The FAA point of contact at the ARTCC should test and verify codex modem operation. The FAA point of contact will provide instructions and should direct efforts needed to verify the codex modem is operational.

This completes the internal codex modem connection/activation procedure.

INSTALLATION OVERVIEW FOR CONNECTING AN EXTERNAL CODEX MODEM:

When an ASOS is connected to an external codex modem, the long line communication path is usually over an existing FAA network (typically the FAA's Data Multiplexing Network, or DMN). The ASOS data is multiplexed onto an existing FAA communication circuit by the codex modem and is demultiplexed at a FAA, ARTCC by another codex modem.

The connection activities involved in connecting ASOS to an external codex modem are limited to configuring an ASOS serial I/O port for use as an Automated Data Acquisition System (ADAS) interface and connecting the serial I/O port to the J29 connector on the ACU I/O panel. The FAA should provide the cable connecting J29 to the external codex modem.

1.0 EXTERNAL CONNECTION CODEX MODEM AND ACTIVATION:

   Before traveling to an ASOS site:

   a. Sites listed in **Appendix B** contains **external codex modems**.

   b. Contact Jerry Kranz prior to going to the ASOS site.

   c. Sites listed in Appendix B that require installation of an SIO card are indicated by a check mark (T). Remotely access the ASOS and verify that an SIO port is available to be assigned to the codex modem (ADAS). Two consecutive ports on a single SIO card must be available. Ports 1 and 2 or Ports 3 and 4 are the only allowable configurations. If the ports are not available, an additional SIO board (XVME-490/1) will be required and installed. Contact Bobby McCormick to obtain an SIO board.

2.0 INSTALLATION STEPS FOR EXTERNAL CONNECTION AND ACTIVATION.

Once at a site, complete the following:

   a. If required, install the additional SIO board according to the site technical manual.

   b. Access the ACU I/O panel assembly and disconnect any cable that may be connected to the inner DB-25 connector at I/O panel location J29 (this cable was most likely connected to an RS-422 port on SIO board #1). Cover the SIO board #1 cable connector with foam or another nonconductive substance and store inside the ACU.

   c. Locate the cable from the RS-232 SIO port to be used for the ADAS interface and connect to the inner DB-25 connector at location J29. The cable should be run with existing cables down the interior of the ACU cabinet to the I/O panel and connected to the EMI filter/surge suppressor.

d. The ASOS SIO port which communicates with the codex modem must be configured properly and enabled. Ensure that the SIO port configuration, obtained from the ASOS COMMS configuration page, reflects the following:

FUNCTION	ADAS	**HANDSHAKE**	SYNCHRONOUS
STATUS	ENABLED	**CONNECTION**	HARD-WIRE
BAUD RATE	2400		
PARITY SELECT	NONE		
BITS/CHAR	8		
STOP BITS	1		

e. The "ASOS ADDRESS" field on the ASOS EXTERNAL COMMUNICATIONS page (REVUE-SITE-CONFG-EXTRN) will need to contain the ASOS polling address as assigned by the ADAS. This parameter can be entered by the ASOS technician if it is available or it can be entered by the AOMC when it becomes available. By default the address is 100, which is an invalid ADAS address. Valid addresses are odd numbers from 03 to 21.

This completes the external codex modem connection/activation procedure.

W/OSO321:BGMcCormick:713-1834x167:5/22/97
K:\OSO32\OSO321\asomod45.wpd
revised:6/3/96:spellchecked:5/22/97:nmb:/6/3/97:src

Appendix A

Sites requiring connection to INTERNAL Codex modem

	SID	LOCATION	ST	NEEDING SIO CARD
1	BPK	Mountain Home	AR	
2	DEQ	De Queen	AR	
3	HKA	Blytheville	AR	
4	HOT	Hot Springs	AR	
5	HRO	Harrison	AR	
6	JBR	Jonesboro	AR	
7	LLQ	Monticello	AR	T
8	PBF	Pine Bluff	AR	
9	RUE	Russellville	AR	
10	OLS	Nogales	AZ	
11	SJN	St. Johns	AZ	
12	ACV	Arcata	CA	
13	BLH	Blythe	CA	
14	L32	Oceanside	CA	
15	O18	Hanford	CA	
16	STS	Santa Rosa	CA	
17	WVI	Watsonville	CA	T
18	MMK	Meriden	CT	
19	GED	Georgetown	DE	
20	ABY	Albany	GA	
21	AMG	Alma	GA	
22	VPC	Cartesville	GA	
23	3SM	Shelbyville	IN	
24	VPZ	Valparaiso	IN	
25	6RO	Slidell	LA	
26	HUL	Hulton	ME	
27	ADG	Adrian	MI	
28	CMX	Hancock	MI	
29	RWF	Redwood Falls	MN	
30	HBG	Hattiesburg	MS	
31	HKS	Jackson	MS	T
32	AKH	Gastonia	NC	

	SID	LOCATION	ST	NEEDING SIO CARD
33	BUY	Burlington	NC	
34	EQY	Monroe	NC	
35	LBT	Lumberton	NC	
36	MRH	Beauford	NC	
37	CDR	Chadron	NE	
38	6B1	Rochester	NH	
39	FWN	Sussex	NJ	
40	MEB	Maxton	NC	
41	N52	Somerville	NJ	
42	VAY	Mt. Holly	NJ	
43	DMN	Deming	NM	
44	GUP	Gallup	NM	
45	TCC	Tucumcari	NM	
46	LOL	Lovelock	NV	
47	TPH	Tonopah	NV	
48	ART	Watertown	NY	
49	DSV	Danville	NY	
50	FOK	Westhampton Beach	NY	
51	PLB	Plattsburgh	NY	
52	2I8	Newark	OH	
53	AOH	Lima	OH	
54	DFI	Defiance	OH	
55	MGY	Dayton	OH	
56	MNN	Marion	OH	
57	TDZ	Toledo	OH	
58	S22	Hermiston	OR	
59	JST	Johnstown	PA	
60	MPO	Mt. Ponoco	PA	
61	N88	Doylestown	PA	
62	N97	Clearfield	PA	
63	SEG	Selinsgrove	PA	
64	29J	Rock Hill	SC	
65	CEU	Clemson	SC	
66	FLO	Florence	SC	
67	GRD	Greeenwood	SC	
68	CSV	Crossville	TN	
69	ALI	Alice	TX	
70	F54	Arlington	TX	
71	INK	Wink	TX	
72	MWL	Mineral Wells	TX	

	SID	LOCATION	ST	NEEDING SIO CARD
73	T31	Port Isabel	TX	
74	TKI	McKinney	TX	
75	BCE	Bryce Canyon	UT	
76	CNY	Moab	UT	
77	LGU	Logan	UT	
78	PUC	Price	UT	
79	VEL	Vernel	UT	
80	5B5	Bennington	VT	
81	ELN	Ellensburg	WA	
82	FHR	Friday Harbor	WA	
83	ASX	Ashland	WI	
84	AUW	Wausau	WI	
85	LNR	Lone Rock	WI	
86	OVS	Boscobel	WI	
87	BPI	Big Piney	WY	
88	BYG	Buffalo	WY	
89	DGW	Douglas	WY	
90	EVW	Evanston	WY	T
91	GEY	Greybull	WY	
92	LAR	Laramie	WY	
93	TOR	Torrington	WY	
94	WRL	Worland	WY	

Appendix B

Sites requiring connection to EXTERNAL Codex modem

	SID	LOCATION	ST	NEEDING SIO CARD
1	ANB	Anniston	AL	
2	DHN	Dothan	AL	T
3	TCL	Tuscaloosa	AL	T
4	ELD	El Dorado	AR	
5	LIT	Little Rock	AR	T
6	DVT	Phoenix	AZ	
7	PRC	Prescott	AZ	
8	SDL	Scottsdale	AZ	
9	APC	Napa	CA	T
10	AVX	Avalon	CA	
11	BUR	Burbank	CA	
12	CNO	Chino	CA	
13	CRQ	Carlsbad	CA	
14	DAG	Daggett	CA	
15	FUL	Fullerton	CA	
16	HHR	Hawthorne	CA	
17	HWD	Hayward	CA	T
18	IPL	Imperial	CA	
19	LVK	Livermore	CA	
20	MAE	Madera	CA	T
21	MOD	Modesto	CA	
22	MRY	Monterey	CA	
23	MYF	San Diego	CA	
24	MYV	Marysville	CA	
25	O45	Vacaville	CA	
26	OAK	Oakland	CA	
27	ONT	Ontario	CA	
28	OVE	Oroville	CA	T
29	OXR	Oxnard	CA	
30	PMD	Palmdale	CA	
31	PRB	Paso Robles	CA	
32	PSP	Palm Springs	CA	
33	RAL	Riverside	CA	
34	SAC	Sacramento	CA	
35	SBA	Santa Barbara	CA	T
36	SBP	San Luis-Obispo	CA	
37	SJC	San Jose	CA	T
38	SMF	Sacramento	CA	

	SID	LOCATION	ST	NEEDING SIO CARD
39	SMO	Santa Monica	CA	
40	SNA	Santa Ana	CA	
41	SNS	Salinas	CA	
42	TRM	Thermal	CA	
43	TVL	South Lake Tahoe	CA	
44	VNY	Van Nuys	CA	
45	APA	Denver	CO	
46	ASE	Aspen	CO	
47	DXR	Danbury	CT	
48	GON	Groton	CT	
49	HVN	New Haven	CT	
50	FLL	Ft. Lauderdale	FL	
51	FMY	Fort Myers	FL	
52	FPR	Fort Pierce	FL	
53	FXE	Ft. Lauderdale	FL	
54	HWO	Hollywood	FL	
55	MLB	Melbourne	FL	
56	OPF	Miami	FL	
57	ORL	Orlando	FL	
58	PFN	Panama City	FL	
59	PIE	St. Petersburg	FL	
60	PMP	Pompano Beach	FL	
61	RSW	Fort Myers	FL	
62	SPG	St. Petersburg	FL	
63	SRQ	Sarasota	FL	
64	TMB	Miami	FL	
65	VRB	Vero Beach	FL	T
66	FTY	Atlanta	GA	T
67	GNV	Gainesville	FL	
68	PDK	Atlanta	GA	
69	SSI	Brunswick	GA	
70	MCW	Mason City	IA	
71	OTM	Ottumwa	IA	
72	BYI	Burley	ID	
73	U11	Rexburg	ID	T
74	ARR	Aurora	IL	
75	DEC	Decatur	IL	
76	LAF	Lafayette	IN	T
77	LOU	Louisville	KY	T
78	LFT	Lafayette	LA	T
79	MLU	Monroe	LA	T

	SID	LOCATION	ST	NEEDING SIO CARD
80	NEW	New Orleans	LA	
81	BAF	Westfield	MA	
82	BED	Bedford	MA	
83	PSF	Pittsfield	MA	
84	HGR	Hagerstown	MD	
85	N80	Ocean City	MD	T
86	SBY	Salisbury	MD	
87	AUG	Augusta	ME	
88	BGR	Bangor	ME	
89	BVY	Beverly	ME	
90	ARB	Ann Arbor	MI	
91	AZO	Kalamazoo	MI	
92	BTL	Battle Creek	MI	
93	DET	Detroit	MI	T
94	MBS	Saginaw	MI	
95	PTK	Pontiac	MI	
96	TVC	Traverse City	MI	
97	YIP	Ypsilanti	MI	
98	FCM	Minneapolis	MN	
99	MKC	Kansas City	MO	
100	SUS	St. Louis	MO	
101	GLH	Greenville	MS	
102	ECG	Elizabeth City	NC	
103	FAY	Fayetteville	NC	
104	HKY	Hickory	NC	
105	IGX	Chapell Hill	NC	
106	INT	Winston Salem	NC	
107	RWI	Rocky Mount	NC	
108	RZZ	Roanoke Rapids	NC	
109	DIK	Dickenson	ND	
110	GFK	Grand Forks	ND	
111	JMS	Jamestown	ND	
112	MOT	Minot	ND	
113	LEB	Lebanon	NH	
114	MHT	Manchester	NH	
115	CDW	Caldwell	NJ	
116	TTN	Trenton	NJ	
117	CNM	Carlsbad	NM	
118	SAF	Santa Fe	NM	
119	EKO	Elko	NV	
120	ELM	Elmira	NY	

	SID	LOCATION	ST	NEEDING SIO CARD
121	ELZ	Wellsville	NY	
122	FRG	Farmingdale	NY	
123	GFL	Glen Falls	NY	
124	HPN	White Plains	NY	
125	HWV	Shirley	NY	
126	IAG	Niagara Falls	NY	T
127	ISP	Islip	NY	
128	MIV	Millville	NY	
129	MSS	Massena	NY	
130	POU	Poughkeepsie	NY	
131	PTW	Pottstown	NY	
132	SLK	Saranac Lake	NY	T
133	UCA	Utica	NY	T
134	AKR	Akron	OH	
135	BKL	Cleveland	OH	
136	OSU	Columbus	OH	
137	ZZV	Zanesville	OH	
138	1S4	Scappose	OR	
139	BKE	Baker	OR	
140	DLS	The Dalles	OR	
141	HIO	Portland	OR	
142	LMT	Klamath Falls	OR	T
143	TTD	Portland	OR	
144	AGC	Pittsburgh	PA	
145	AOO	Altoona	PA	
146	CXY	Harrisburg	PA	
147	LNS	Lancaster	PA	
148	MDT	Harrisburg	PA	
149	RDG	Reading	PA	
150	WST	Westerly	RI	
151	AND	Anderson	SC	
152	CRE	North Myrtle Beach	SC	
153	GMU	Greenville	SC	
154	CKV	Clarksville	TN	
155	MEM	Memphis	TN	
156	AFW	Ft. Worth	TX	
157	ARA	New Iberia	TX	
158	DAL	Dallas	TX	
159	DHT	Dalhart	TX	
160	DWH	Houston	TX	
161	FTW	Ft. Worth	TX	

	SID	LOCATION	ST	NEEDING SIO CARD
162	GGG	Longview	TX	
163	HOU	Houston	TX	
164	LBX	Angelton/Port Jackson	TX	
165	LFK	Lufkin	TX	
166	MCB	McComb	TX	
167	RBD	Dallas	TX	
168	SSF	San Antonio	TX	
169	TYR	Tyler	TX	
170	CDC	Cedar City	UT	
171	OGD	Ogden	UT	
172	CHO	Charlottesville	VA	
173	PHF	Newport News	VA	
174	07S	Deer Park	WA	T
175	ALW	Walla Walla	WA	
176	BFI	Seattle	WA	
177	BLI	Bellingham	WA	
178	EPH	Ephrata	WA	
179	HQM	Hoquiam	WA	
180	PAE	Everett	WA	
181	PSC	Pasco	WA	
182	PUW	Pullman	WA	T
183	RNT	Renton	WA	
184	SFF	Spokane	WA	T
185	LSE	Lacrosse	WI	
186	CKB	Clarksburg	WV	
187	HLG	Wheeling	WV	
188	MGW	Morgantown	WV	
189	MRB	Martinsburg	WV	